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ABSTRACT

This bibliography lists 86 references, most of which are annotated, to papers and journal articles on computer assisted learning (CAL) in the Soviet Union. Topics dealt with include problem solving models, decision strategies, programmed instruction, algorithms, simulation, educational games, databases, and testing. The references have been extracted from the computer based CAL bibliography maintained by the CEDAR Project. (Author/CHV)

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COMPUTER BASED LEARNING IN THE SOVIET UNION - I

N.J. Rushby

OCTOBER 1978

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This bibliography lists 86 references to papers on Computer Assisted Learning in the Soviet Union. The references have been extracted from the computer based CAL Bibliography maintained by the CEDAR Project.

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IR007827

<R 1>
TALYZINA, N F
WAYS OF USING TECHNICAL MEANS OF INSTRUCTION
PROGRAMMIROVANNIYO OBUCHNIYE NO 14, 1977. PP 111-115.
(THE PAPER DEALS WITH PREMISES AND METHODS OF USING TECHNICAL MEANS OF INSTRUCTION ALONGSIDE WITH THEIR ORIGIN AND DEVELOPMENT. THE MAIN TRENDS ARE ANALYSED IN THE USE OF TECHNICAL MEANS OF INSTRUCTION IN DIFFERENT ASPECTS OF TEACHING PROCEDURE. THE MOST PERSPECTIVE DIRECTIONS IN THE USE OF TECHNICAL MEANS IN THE INSTRUCTIONAL PROCESS ARE CONSIDERED AS WELL)

<R 2>
IVASHCHENKO, A V
ON USE OF COMPUTERS IN SOLVING PROBLEMS ON STRENGTH OF MATERIALS
PROGRAMMIROVANNIYO OBUCHNIYE NO 14, 1977, PP 60-64.
(THE ARTICLE IS DEVOTED TO THE USE OF THE SMALL COMPUTER PROMIN-2 IN SOLVING ENGINEERING PROBLEMS OF GENERAL CHARACTER IN THE MAIN SECTIONS OF THE SUBJECT STRENGTH OF MATERIALS IN HIGHER EDUCATIONAL ESTABLISHMENTS. THE AUTHOR SUGGESTS A DIFFERENT APPROACH COMPARED WITH THE TRADITIONAL ONE, TO SOLVING SUCH PROBLEMS AS CALCULATION OF SAFETY OF THE STATICALLY INDETERMINATE BEAMS, DETERMINATION OF BEAM REPLACEMENT DURING BENDING ETC. EXAMPLES ARE FURNISHED CONFIRMING THE PRACTICABILITY OF USE OF SMALL COMPUTERS IN THE JUNIOR COURSES IN TEACHING STRENGTH OF MATERIALS IN PARTICULAR)

<R 3>
LOSHKOKOVA, L I, KHARCHENKO, E I
LESSONS ON MATHEMATICS WITH THE USE OF CONTROL DEVICES
PROGRAMMIROVANNIYO OBUCHNIYE NO, 14, 1977, PP 55-60.
(THE ARTICLE DEALS WITH THE METHODS OF CONDUCTING CERTAIN LESSONS ON MATHEMATICS, CONTROL DEVICES KISI-5 BEING USED. THE AUTHOR PROVES THAT STUDENTS' EFFICIENCY AND SELFDEPENDENCY OF WORK IS ACHIEVED AT THE LESSONS OF SELFCONTROL, INDIVIDUAL LESSONS, AND TRAINING AND TRAINING CONSULTATIVE LESSONS)

<R 4>
OZHOGIN, V J, CHERNOSVITOV, N M
DEVICE FOR INSTRUCTION AND KNOWLEDGE CONTROL KISI-10
PROGRAMMIROVANNIYO OBUCHNIYE NO, 14, 1977, PP 45-55.
(THE PAPER DEALS WITH CHARACTERISTIC PECULIARITIES OF THE TEACHING DEVICE KISI-10, CONFIRMING THE INCREASED METHODICAL POSSIBILITIES OF USING SUCH DEVICES IN THE INSTRUCTION PROCESS. THE WORK OF THE DEVICE IS PRESENTED IN TERMS OF DIVERS REGIMES AND STRESS IS LAID UPON METHODICAL REQUIREMENTS TO THE SCHEMING OF PROGRAMMES)

<R 5>
MASLOVA, G G, SHAPOVALENKO, S G
COMPLEXES OF TEACHING AIDS
ASPECTS OF EDUCATIONAL TECHNOLOGY.
PP 25-28.

<R 6>
EDWARDS, K F
PROGRAMMED LEARNING IN THE SOVIET BLOC COUNTRIES
ASPECTS OF EDUCATIONAL TECHNOLOGY. PP197-201.
(THE SOCIALIST COUNTRIES CAME TO PROGRAMMED LEARNING ABOUT FIVE YEARS LATER THAN THE UNITED STATES. DURING THIS TIME LAG, THE NEW DISCIPLINE OF CYBERNETICS HAD NOT ONLY FIRED THE IMAGINATION OF ENGINERRS, BUT EDUCATORS, SOCIOLOGISTS AND BIOLOGISTS HAD BEGUN TO SEE THEIR SCIENCES IN A NEW LIGHT. FROM THE START, PROGRAMMED LEARNING CAME UNDER THE INFLUENCE OF CYBERNETIC THOUGHT. CYBERNETI IS DEFINED AS THE THEORY OF DYNAMIC, SELF-REGULATING AND SELF-ORGANISING SYSTEMS. IF TEACHER OR TEXTBOOK OR MACHINE ARE REGARDED AS ONE SUCH SELF-ORGANISING SYSTEM AND THE STUDENT THE OTHER, THE

INTERACTION BETWEEN THE TWO POSES A NUMBER OF PROBLEMS. THESE ARE VIEWED UNDER THE FOLLOWING FOUR ASPECTS, THE SYSTEMS ASPECT, THE REGULATION ASPECT, THE INFORMATION ASPECT AND THE GAMES THEORY ASPECT. TO PROGRAMMERS WORKING ON A STIMULUS-RESPONSE BASIS, THE SOVIET THEORIES AND EXPERIMENTS OFFER AN EXCITING AND CONTRAVERSIA CHALLENGE)

<R 7>
ILYINA, T A
THE DEVELOPMENT OF THE RESEARCH WORK ON PROGRAMMED INSTRUCTION IN THE USSR
ASPECTS OF EDUCATIONAL TECHNOLOGY. PP 13-24.

<R 8>
CHEPELEV, V I, PODLASSY, I P
ON ROLE OF PROGNOSIS IN WORKING OUT HIGHLY EFFECTIVE TEACHING PROG
PROGRAMMIROVANNIYO OBUCHNIYE NO 14, PP 30-33.
(THE PAPER CONSIDERS PROGNOSIS TO BE ONE OF THE MOST IMPORTANT FACTORS IN WORKING OUT HIGHLY EFFECTIVE TEACHING PROGRAMMES. THE AIM OF THE PROGNOSIS AND THE WAYS OF THEIR REALISATION ARE DEFINED AS WELL)

<R 9>
GEBOS, A I
DEPENDENCE OF PROGRAMMED INSTRUCTION EFFECTIVENESS ON LEVEL OF ITS PROBLEMACITY
PROGRAMMIROVANNIYO OBUCHNIYE NO 14, PP 34-39.
(THE PAPER PRESENTS A SITUATIONAL APPROACH TO PROGRAMMED INSTRUCTI THE NECESSITY OF CREATING PROBLEM SITUATIONS IS ENHANCED. TWO WAYS OF REALISING THE INTERNAL FEEDBACK ARE CONCERNED AS WELL. TWO INSTRUCTIVE PROGRAMMES ON MAIN CHARACTERISTICS OF ATTENTION, NOTAB FOR THEIR DIFFERENT LEVELS OF PROBLEMACITY HAVE BEEN COMPARED BY T AUTHOR FROM THE POINT OF VIEW OF THEIR ASSIMILATION BY THE STUDENT THE PROGRAMME, WITH SOME ELEMENTS OF INVESTIGATION ON THE PART OF THE STUDENTS APPEARS TO BE THE MORE EFFECTIVE)

<R 10>
NORKIN, K A, SUZDALCEV, B P, TEREKHOV, V M, KHALILOV, S N
AUTOMATIC FIX OF THE RESULTS OF TESTING
PROGRAMMIROVANNIYO OBUCHNIYE NO 14, PP 69-74.
(THE PAPER DEALS WITH THE USE OF SOME CONTROLLING DEVICES WHICH AUTOMATICALLY FIX THE RESULTS OF THE TESTING OF A GROUP OF STUDENT THE EFFICIENCY IS EMPHASISED OF COMPLEX APPLICATION OF CONTROLLING MACHINES AND PROGRAMMED HANDBOOKS. THERE HAS BEEN POINTED OUT A POSSIBILITY OF USING COMPUTERS WITH TECHNICAL DEVICES)

<R 11>
TAUKACH, G L
METHODS FOR DETERMINING POSSIBILITIES OF TRAINING SPECIALISTS SYST
PROGRAMMIROVANNIYO OBUCHNIYE NO 14, PP 78-83.
(THE PAPER DEALS WITH THE METHODS FOR THE DETERMINATION OF THE POSSIBILITIES OF THE SYSTEMS FOR TRAINING SPECIALISTS. THE METHODS MAY BE USED FOR GENERAL EVALUATION OF THE TOTAL SYSTEM CAPACITY (ALLOWING FOR DROP-OUT RATE), FOR COMPUTING THE ENROLMENT, FOR FINDING OUT THE NECESSARY NUMBER OF COLLEGES WITH OPTIMAL CAPACITY

<R 12>
FEDOSOVA, E V
DEVELOPMENT OF CREATIVE THINKING IN PROCESS OF STUDENTS RESEARCH W
PROGRAMMIROVANNIYO OBUCHNIYE NO 14, PP 98-106.
(THE PAPER DEALS WITH THE CHARACTERISTICS OF THE EKO-DELPHI HEURIS METHOD. DIDACTICS POSSIBILITIES OF THIS METHOD TO FORM ENGINEERING WAY OF THINKING ARE ANALYSED IN THE PROCESS OF STUDENTS RESEARCH WORK AT A COLLEGE. THE METHOD HAS BEEN WORKED OUT BY THE CHAIR OF TECHNOLOGY OF CONSTRUCTIVE PRODUCTION AND THE KIEV CIVIL ENGINEERI INSTITUTE, KISI)

<R 13>
MOSSOKOVSKY, V I, KHMELNITSKY, V F, BOBROVSKY, V P
COMPUTERS IN THE INSTRUCTION PROCESS OF DNIEPROPETROVSK UNIVERSITY
PROGRAMMIROVANNIYO OBUCHNIYE NO 13, 1976. PP 42-46.
(THE COMPUTING CENTRE ACTIVITY AT DNIEPROPETROVSK UNIVERSITY IS DESCRIBED IN THE ARTICLE. IT INCLUDES THE EDUCATIONAL AND PRACTICA TRAINING, THE PUBLICATION OF HANDBOOKS AND CARRYING OUT RESEARCH WORK. THE EFFECTIVE USE OF THE MACHINE-TIME FACTOR IS RAISED ON TH ACCOUNT OF THE INTRODUCTION OF THE DISPATCHER OPERATOR COMPUTER-SYSTEM WHICH IS SUPPOSED TO GIVE PRIORITY TO PROBLEMS AND TO OPTIMI THEIR DISPATCHER WORKIG OUT. THE PROGRAMMED CONTROL SYSTEM IS USED FOR CHECKING UP STUDENTS STUDIES OF ALGORITHM LANGUAGES)

<R 14>
KUPISEVITCH, CH
PROGRAMMED INSTRUCTION - TWENTY YEARS LATER
PROGRAMMIROVANNIYO OBUCHNIYE NO 13, 1976. PP 89-96.
(THE PROGRESS OF PROGRAMMED INSTRUCTION DEVELOPMENT DURING THE PER OF TWENTY YEARS IS CONSIDERED IN THE ARTICLE. SHORT CHARACTERISTIC OF THE SO-CALLED CLASSICAL PROGRAMMED INSTRUCTION AND ITS FURTHER PERFECTION - TRANSITION TO WORKING OUT MIXED AND BLOCK PROGRAMMES IS GIVEN HERE. THE AUTHOR INTRODUCES THE RESULTS OF PROGRAMMED INSTRUCTION RESEARCH AAND ITS USE IN EDUCATIONAL WORK, BOTH IN SOCIALIST COUNTRIES AND IN DEVELOPED CAPITALIST STATES. A PROGRAMM INSTRUCTION DEVELOPMENT PERSPECTIVE IS ESTEEMED AND ITS PLACE IN THE EDUCATION SYSTEM IS STATED. THE AUTHOR HAS EMPHASISED THE AUXILIARY FUNCTION OF PROGRAMMED INSTRUCTION COMPARED WITH OTHER METHODS OF TEACHING. HE ALSO POINTS OUT THE MOST EFFECTIVE DOMAINS WHERE PROGRAMMED INSTAUCTION METHODS AND MEANS ARE USED IN THE EDUCATION PROCESS)

<R 15>
FEDOSOVA, E V
SYSTEMATIC INFORMATION OF PUBLICATIONS IN THE FIELD OF THEORY AND METHODOLOGY OF PROGRAMMED TEACHING
PROGRAMMIROVANNIYO OBUCHNIYE NO 13, 1976. PP 98-100.
(THE PAPER DEALS WITH THE EXPERIENCE GAINED BY THE INFORMATION SCIENTIFIC RESEARCH CENTRE AT KARL MARX LEIPZIG UNIVERSITY. THE SUBJECT MATTER OF THE GIVEN WORKS IS KINDS OF PRINTED INFORMATION ON THE QUESTIONS OF PROGRAMMED INSTRUCTION, PUBLISHED AS SYSTEMATI EXPRESS INFORMATION AND PERIODICAL EDITIONS OF SPECIAL BIBLIOGRAPH INDICES IN THIS FIELD. LATEST BIBLIOGRAPHY (1974) IS CONSIDERED AS WELL)

<R 16>
STOGNUT, A S
AN INTERESTING WORK ON SCIENTIFIC ORGANISATION OF STUDY PROCESS
PROGRAMMIROVANNIYO OBUCHNIYE NO 13, 1976. PP 96-98.
(THE AUTHOR OF THE ARTICLE ANALYSES DR. ROLAND SCHENE'S ESSAY, DED TO PROBLEMS OF SCIENTIFIC ORGANISATION OF INSTRUCTION PROCESS IN T USSR HIGHER SCHOOL ESTABLISHMENTS. IN PART 1, THE AUTHOR GIVES A BRIEF ANALYSIS OF SOVIET SCIENTIFIC PUBLICATIONS ON HIGHER SCHOOLS PROBLEMS. PARTS 2 AND 3 CONTAIN AN ORDERLY CATALOGUE OF THE USSR PUBLICATIONS CONCERNIG THE AFOREMENTIONED DOMAIN FROM 1968 TO 1973 IN ADDITION, A SYSTEMATISED BIBLIOGRAPHY SET FORTH ON 50 PUNCHED C IS GIVEN. THE NECESSITY AND USEFULNESS OF THIS WORK IS EMPHASISED THE AUTHOR)

<R 17>
CHECHEL, E G
WAYS OF IMPROVING INSTRUCTION EFFICIENCY IN TEACHING FOREIGN LANGUAGES IN NON-LINGUISTIC HIGHER EDUCATIONAL ESTABLISHMENTS
PROGRAMMIROVANNIYO OBUCHNIYE NO 13, 1976. PP 65-70.
(THE ARTICLE DEALS WITH THE PROBLEM OF IMPROVING THE TEACHING OF FOREIGN LANGUAGES IN NON-LINGUISTIC INSTITUTES. THE FOLLOWING FACTORS ARE TAKEN INTO ACCOUNT - THE METHOD OF TEACHING, THE SYSTE OF WORK IN LABS, IN CLASS AND AT HOME. THE EXPERIMENTAL RESULTS AR PRESENTED IN THE ARTICLE)

<R 18>
GUTS, T I, LAZARENKO, L P
INVESTIGATION OF PROGRAMMED ANSWER CHECKS
PROGRAMMIROVANNIYO OBUCHNIYE NO 13, 1976. PP 55-58.
(IN THIS ARTICLE, THE AUTHOR SETS FORTH THE RESULTS OF PROGRAMMED INVESTIGATION OF STUDENTS QUESTIONING ON THE COURSE OF THEORETICAL MECHANICS AT LABS. THE ARTICLE INCLUDES DIFFERECT VARIANTS OF TEST QUESTIONING, THE TEACHERS TEST CARD, ALLOWING TO ESTIMATE STU ANSWERS, A COEFFICIENT CALCULATING CONTROL TABLE AND THE INVESTIGA RESULTS. THE AUTHORS COME TO CONCLUSIONS THAT A TEACHER SHOULD CON QUESTIONING BY MEANS OF TEST QUESTIONS IN THE COURSE OF THE CURREN CHECKING UP OF STUDENTS KNOWLEDGE)

<R 19>
MATYUSHKO, E S
LESSON IN AN AUTOMATED CLASS
PROGRAMMIROVANNIYO OBUCHNIYE NO 13, 1976. PP 51-55.
(THE ARTICLE DEALS WITH THE METHODS OF CONDUCTING A SCHOOL LESSON AUTOMATED CLASS. PARTICULAR ATTENTION IS GIVEN TO THE LESSON AT WH PROGRAMMED DIAFILMS ARE DEMONSTRATED. AT THE LESSONS, THE PUPILS A ACTIVE ENOUGH AND AN EFFICIENT FEEDBACK IS GUARANTEED. THIS ALLOWS THE TEACHER TO KNOW THE DEGREE OF MASTERING THE NEW MATERIAL AND T MAKE NECESSARY DECISIONS. DUE TO THE LATTER, THE EFFICIENCY OF THE LESSON IS RAISED)

<R 20>
ORLOV, N N
LONG TERM PLANNING OF TRAINING SPECIALISTS
PROGRAMMIROVANNIYO OBUCHNIYE NO 13, 1976. PP 3-8.
(THE PAPER DEALS WITH URGENT TASKS OF RAISING THE SCIENTIFIC LEVEL OF PLANNING THE TRAINING OF SPECIALISTS OF VARIOUS PROFILES AND QUALIFICATION. A SPECIAL EMPHASIS IS LAID ON A NUMBER OF MEASURES TAKEN WITH THE VIEW TO FURTHER PERFECTING OF HIGHER AND SPECIALISE SECONDARY EDUCATION. THE PAPER GIVES POSSIBLE WAYS OF SOLVING THESE TASKS IN ACCORDANCE WITH THE REQUIREMENTS LAID DOWN IN THE DECISIONS OF TE COMMUNIST PARTY AND THE SOVIET GOVERNMENT CONCERNI FURTHER PERFECTING OF HIGHER AND SPECIALISED SECONDARY EDUCATION I THE COUNTRY. THE ATTENTION OF SCIENTISTS AND PEDAGOGUES WORKING IN THE HIGHER EDUCATIONAL ESTABLISHMENTS OF THE UKRAINIAN SSR IS DRAW TO THE NECESSITY OF ACTIVE CARRYING OUT THE SCIENTIFIC RESEARCH IN FIELD AND OFFERING CONCRETE PRACTICAL RECOMMENDATIONS)

<R 21>
CHERNYAVSKY, A F, TARNOPOLSKY, A I, MUKHARSKY, A M, VASKOV, O S
A SPECIALISED DISPLAY COMPLEX FOR TEACHING CHEMISTRY BY MEANS OF A COMPUTER
PAPER GIVEN AT INTERNATIONAL CONFERENCE ON COMPUTERS IN CHEMICAL RESEARCH AND EDUCATION. USSR ACADEMY OF SCIENCES, SIBERIAN DIVISION, NOVOSIBIRSK, JUNE 1978.
(AUTHORS AT BYELORUSSIAN V.I. LENIN STATE UNIVERSITY, MINSK, USSR. IN THIS PAPER, SPECIAL REQUIREMENTS TO THE TERMINAL HARDWARE OF THE AUTOMATIZED INSTRUCTION SYSTEM ARE CONSIDERED AND THE EXPERIENCE OF DEVELOPING AND OPERATING OF SUCH A

SYSTEM IS PRESENTED. IN THE BYELORUSSIAN UNIVERSITY REGULAR LESSONS IN INORGANIC CHEMISTRY HAVE BEEN CONDUCTED SINCE 1976 USING THE EXPERIMENTAL COMPUTER EDUCATING SYSTEM. THE EDUCATING DIALOGUE IS CONDUCTED USING THE TRADITIONAL CHEMICAL SYMBOLS. WITH THIS PURPOSE IN VIEW, A SET OF THE EXTENDED ALPHABET OF SYMBOLS, INDICES AND OTHER SPECIAL SIGNS IS SUPPLIED AS WELL AS ITS DISPLAY AT THE STUDENTS CONSOLES. TO SPEED UP THE DIALING OF CHEMICAL FORMULAE THERE ARE SPECIAL KEYS ON THE CONSOLE. DURING THE LESSONS, STUDENTS MAY USE COMPUTER PROGRAMS AND REFERENCE DATA ON CHEMISTRY. THE DESIGN OF THE AUTOMATIZED INSTRUCTION SYSTEM IS COMPATIBLE WITH THE EDUCATIONAL TV SYSTEM ORIENTED TO THE ES COMPUTER IS BEING COMPLETED. STUDENTS TERMINALS SUPPLY THE DISPLAY OF SYMBOL AND GRAPHIC INFORMATION (STRUCTURAL FORMULAE, SPECTROGRAMS ETC) WHICH PROVIDES THE EFFECTIVE USING OF THE COMPUTER POWER OF THE UPDATE COMPUTERS AND THE TV POSSIBILITIES)

<R 22>

KIRICHENKO, E A, ERMAKOV, A I

THE LABORATORY PRACTICAL WORK IN THE COURSE OF COMMON AND INORGANIC CHEMISTRY ON THE BASIS OF COMPUTERS
PAPER GIVEN AT INTERNATIONAL CONFERENCE ON COMPUTERS IN CHEMICAL RESEARCH AND EDUCATION. USSR ACADEMY OF SCIENCES, SIBERIAN DIVISION, NOVOSIBIRSK, JUNE 1978.
(AUTHORS AT THE BRANCH OF MOSCOW MENDELEEV CHEMICO-TECHNOLOGICAL INSTITUTE IN NOVOMOSKOVSK, USSR. THE REPORT DISCUSSES SOME PROBLEMS DEALING WITH WORKING OUT THE LABORATORY PRACTICAL WORK FOR STUDENTS IN THE SECTION STRUCTURE OF ATOMS AND MOLECULES OF THE COURSE OF COMMON AND INORGANIC CHEMISTRY. TECHNICAL AND METHODICAL DIFFICULTIES IN CARRYING OUT COMPLICATED EXPERIMENTS IN THE ABOVE MENTIONED SECTION ARE OBSTACLES IN WORKING OUT SUCH PRACTICAL WORK FOR THE FIRST YEAR STUDENTS. COMPUTERS WITH PROGRAMS WRITTEN IN AN ASSEMBLY LANGUAGE AND FORTRAN IV ARE USED AS PHYSICO-CHEMICAL APPARATUSES IN WORKING OUT PRACTICAL WORK. QUANTUM CHEMICAL CHARACTERISTICS OF ORBITALS OF ATOMS, IONS AND GEOMETRICAL DATA OF MOLECULES ARE INPUT DATA OF THESE PROGRAMS. TOGETHER WITH THE NAME OF A STUDENT THE NUMBER OF HIS GROUP, DATE AND HIS INITIAL JOB, THE COMPUTER PRINTS CALCULATING CHARACTERISTICS OF ATOMS, IONS AND MOLECULES SUCH AS RADII, ENERGIES OF IONISATION, ELECTRON AFFINITIES, ENERGIES OF MOLECULAR ORBITALS, DISTRIBUTION OF ELECTRONIC DENSITY AND ENERGETICAL SPECIES, ACCORDING TO THE TYPE OF THE JOB. THE STUDENTS ANALYSE REGULARITY OF CHANGES OF PROPERTIES IN ROWS OF ATOMS, IONS AND MOLECULES ON THE BASIS OF RESULTS OBTAINED AND EXPLAIN THEM AFTER THEORETICAL STUDYING. THIS PRACTICAL WORK HAS BEEN PERFORMED ON COMPUTERS OF THE ES SERIES)

<R 23>

BUROVAYA, G I, BUROVOY, I A

COMPUTER GAMES FOR TRAINING IN PROCESS CONTROL
PAPER GIVEN AT INTERNATIONAL CONFERENCE ON COMPUTERS IN CHEMICAL RESEARCH AND EDUCATION. USSR ACADEMY OF SCIENCES, SIBERIAN DIVISION, NOVOSIBIRSK, JUNE 1978.
(AUTHORS AT THE MOSCOW INSTITUTE OF STEEL AND ALLOYS, MOSCOW, USSR. TO IMPROVE THE EFFECTIVENESS OF CHEMICAL ENGINEER TRAINING IN PROCESS CONTROL, A BUSINESS GAME IS PROPOSED IN WHICH A SIMULATION MODEL AND TRAINING BY PLAYING GAMES ENABLE THE ENGINEERS TO ACQUIRE THE CONTROL KNOW HOW INDIVIDUALLY AND CREATIVELY. THE BUSINESS GAME IS A VERY FAITHFUL REPRESENTATION OF THE CONTROL ENVIRONMENT. A

MATHEMTAICAL MODEL OF THE PROCESS REPRODUCES THE PROCESS BEHAVIOUR AND A NOISE GENERATOR INTRODUCES SITUATIONS (INCLUDING EMERGENCIES) WHICH THE TRAINERS ARE TAUGHT TO HANDLE. THE AMOUNT, FORMAT, AND SEQUENCES OF INPUT AND OUTPUT DATA FOR THE PLAYERS REPRESENT THE PROCESS CONDITIONS. THE CONTROL PERFORMANCE CRITERIA ARE THOSE OF THE INDUSTRY. TO MAKE THE CONDITIONS IN WHICH HIGH PERFORMANCE IS TO BE OBTAINED MORE REALISTIC, THE NOISE LEVEL IS MADE TO INCREASE WITH THE PERFORMANCE. TO MAKE THE GAME MORE CHALLENGING, CONTEST ELEMENTS AND INCENTIVES ARE INTRODUCED. IN GENERATING THE INCENTIVES, IT IS THE SUCCESS OF THE PLAYERS THAT DICTATES THE SIZE OF THE INCENTIVE, BOTH IN THE CURRENT PERIODS AND IN FUTURE PERIODS, SUCH AS CONDITIONAL SHIFTS OR DAY, IN OTHER WORDS A DYNAMIC COMPONENT IS INTRODUCED WITH STORAGE OF CONTROL RESULTS OVER SEVERAL PERIODS. THE GAME WAS IMPLEMENTED IN A MULTI DISPLAY WANG 200 COMPUTER SYSTEM. THE SOFTWARE MODULES INCLUDE, AN INITIAL PARAMETER AND JOB INPUT BY THE GAME MODERATOR, CONVERSATION WITH THE PLAYERS, PROCESS SIMULATION WITH A NOISE GENERATOR, CONTINUOUS INPUT OF CONTROL SIGNALS INTERACTIVELY FROM THE CONTROL PANEL, COMPUTATION OF THE PERFORMANCE INDICATORS AND THEIR DISPLAY TO PLAYERS AT THE END OF CONDITIONAL SHIFTS, DAYS ETC, INCENTIVE GENERATION. THE GAME WAS RUN FOR NICKEL SLOUID BED PROCESS IN CONSTRAINED THERMAL STABILITY MODES AND PROVED AN EFFECTIVE TRAINING TOOL. THE PLAYERS WERE FAST IN ACQUIRING OLD CONTROL TECHNIQUES AND PROPOSED NEW ONES WHICH IMPROVED THE PRODUCTIVITY AND PRODUCT QUALITY. THE RULES OF THE GAME AND ITS SOFTWARE MAKE IT POSSIBLE WITH MINIMAL MODIFICATION TO RUN OTHER GAMES FOR TRAINING IN PROCESS CONTROL)

<R 24>

KRICHEVSKAYA, E L, MANKINA, L A

THE USE OF ELECTRONIC COMPUTERS IN TRAINING CHEMICAL ENGINEERS AT THE ODESSA RED LABOUR BANNER ORDER POLYTECHNIC INSTITUTE PAPER GIVEN AT INTERNATIONAL CONFERENCE ON COMPUTERS IN CHEMICAL RESEARCH AND EDUCATION. USSR ACADEMY OF SCIENCES, SIBERIAN DIVISION, NOVOSIBIRSK, JUNE 1978.

(THE PAPER DEALS WITH PROBLEMS OF THE USE OF COMPUTERS IN TRAINING CHEMICAL TECHNOLOGY ENGINEERS AND SPECIALISTS IN AUTOMATION OF CHEMICAL PRODUCTION. THE INSTITUTE'S COMPUTING CENTRE IS EQUIPPED WITH ES-1020 AND ES-1022 COMPUTERS AS WELL AS WITH ANALOGUE AND SMALL DIGITAL COMPUTERS AND TERMINAL EQUIPMENT. FIRST AND SECOND YEAR STUDENTS STUDY THE FUNDAMENTALS OF THE SUBJECT COMPUTING TECHNIQUE IN ENGINEERING AND ECONOMIC CALCULATIONS. SPECIAL PART AS APPLIED TO PROBLEMS OF TECHNOLOGY AND AUTOMATION OF CHEMICAL PRODUCTION IS STUDIED IN SENIOR COURSES. STARTING FROM THE THIRD YEAR, STUDENTS USE COMPUTERS IN STUDYING THE AUTOMATIC CONTROL THEORY, SIMULATION OF CHEMICAL AND TECHNOLOGICAL PROCESSES AND IN CARRYING OUT RESEARCH WORK AND COURSE PROJECTS. A SUBROUTINE LIBRARY ON THE AUTOMATIC CONTROL THEORY AND CALCULATIONS IN THE FIELD OF CHEMICAL TECHNOLOGY IS BEING COMPILED. SOME COURSE AND DIPLOMA PROJECTS ARE DEVOTED TO THE DEVELOPMENT OF ALGORITHMS AND ROUTINES FOR THE MOST COMPLEX CALCULATIONS. EXTENSIVELY USED IN DIPLOMA PROJECTS AND WORKS IS MATHEMATICAL SIMULATION OF CHEMICAL AND TECHNOLOGICAL PROCESSES. THE PAPER GIVES A CHARACTERISTIC OF DIPLOMA WORKS ON MODELLING CATALYTIC REACTORS AND CONTROL SYSTEMS DONE AT THE INSTITUTE OF CATALYSIS OF THE USSR ACADEMY OF SCIENCES, AS WELL AS ON MODELLING COMPLEX CHEMICAL AND

TECHNOLOGICAL SCHEMES AND DEVELOPING FRAGMENTS OF ROUTINE LIBRARY FOR AUTOMATED DESIGN SYSTEMS. PROBLEMS OF TEACHING METHODS AND STUDENTS INDEPENDENT WORK ORGANISATION BASED ON PROGRAMMED TRAINING COURSES USING COMPUTERS ARE ALSO DISCUSSED.

<R 25>

LEBEDEV, N N, SEVRYS, V P, MAKAROV, N G, BOCHARKINA, T V

KINETIC EXPERIMENTS COMPUTER MODELLING FOR TEACHING STUDENTS TO CHOOSE THE SORT OF KINETIC EQUATION AND TO ESTIMATE ITS PARAMETERS

PAPER GIVEN AT INTERNATIONAL CONFERENCE ON COMPUTERS IN CHEMICAL RESEARCH AND EDUCATION. USSR ACADEMY OF SCIENCES, SIBERIAN DIVISION, NOVOSIBIRSK, JUNE 1978.

(AUTHORS AT MENDELEEV INSTITUTE OF CHEMICAL TECHNOLOGY, MOSCOW, USSR. ONE OF THE MAIN STAGES OF MODERN ENGINEER PREPARATION IN THE FIELD OF ORGANIC TECHNOLOGY IS TRAINING TO INVESTIGATE ORGANIC REACTION KINETICS AND TO CONSTRUCT A MATHEMATICAL MODEL OF THE INVESTIGATED PROCESS. IN THE MENDELEEV INSTITUTE CURRICULUM THERE IS A COURSE OF LECTURES AND LABORATORY ON THEORY AND METHODS OF ORGANIC REACTIONS INVESTIGATION FOR ORGANIC TECHNOLOGISTS. BEFORE CARRYING OUT PRACTICAL TASKS IN THE LABORATORY, STUDENTS ARE TRAINED TO PLAN EXPERIMENTS, TO CHOOSE THE APPROPRIATE KINETIC EQUATION AND TO ASSESS ITS PARAMETERS. FOR THIS PURPOSE STUDENTS USE MODEL KINETICS EXPERIMENTS WORKED OUT USING A COMPUTER. THE COMPUTER MODEL EXPERIMENTS ARE BASED ON REAL MATHEMATICAL MODELS OF ORGANIC TECHNOLOGY PROCESSES. THESE MODELS INCLUDE KINETIC EQUATIONS OF THE FIRST AND SECOND ORDER REACTIONS, KINETIC EQUATIONS OF HOMOGENEOUS AND HETEROGENEOUS CATALYTIC REACTIONS, AUTOCATALYTIC AND FREE RADICAL CHAINED REACTIONS TRANSFORMED FOR BATCH AND VARIOUS TYPES OF CONTINUOUS CHEMICAL REACTORS.
ACCORDING TO THE SPECIAL PROGRAM, THE COMPUTER CALCULATES CONCENTRATIONS OR CONVERSIONS VIA CONTACT TIME OR TIME WITH NORMAL DISTRIBUTED ERROR. STUDENTS RECEIVE INDIVIDUAL TASKS WHICH CONSIST OF A REACTION, REACTION CONDITIONS, INTERVALS OF REAGENTS AND CATALYST INITIAL CONCENTRATIONS, TEMPERATURE AND KEY REAGENT. A STUDENT PLANS HIS KINETIC EXPERIMENTS, RECEIVES THE RESULTS FROM THE COMPUTER, CHOOSES THE SORT OF KINETIC EQUATION AND ESTIMATE ITS PARAMETERS)

<R 26>

TSUKANOVA, N N, SCHIPIN, Y K, BOYARINOV, A I

UTILISATION OF DATA BASE ON EDUCATIONAL COMPLEX OF HIGH SCHOOL AIS TO ANALYSE STUDENTS PROGRESS IN CHEMICAL AND TECHNOLOGICAL INSTITUTE

PAPER GIVEN AT INTERNATIONAL CONFERENCE ON COMPUTERS IN CHEMICAL RESEARCH AND EDUCATION. USSR ACADEMY OF SCIENCES, SIBERIAN DIVISION, NOVOSIBIRSK, JUNE 1978.

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PAPER GIVEN AT INTERNATIONAL CONFERENCE ON COMPUTERS IN CHEMICAL RESEARCH AND EDUCATION. USSR ACADEMY OF SCIENCES, SIBERIAN DIVISION, NOVOSIBIRSK, JUNE 1978.
(AUTHORS AT BYELORUSSIAN V.I. LENIN STATE UNIVERSITY, MINSK USSR. MATHEMATICAL FUNDAMENTALS OF THE LESSONS IN THE GENERAL AND INORGANIC CHEMISTRY COURSE ARE A COMPLEX OF PROGRAMMES FOR CONDUCTING LESSONS IN A DIALOGUE MODE AND ALSO FOR CONTROLLING THE LEARNING PROCESS, FOR COLLECTING AND PROCESSING VARIOUS EDUCATIONAL INFORMATION. THE COURSE IS SUPPLIED WITH A WIDE SET OF ANALYSIS SYSTEMS.
SAMPLE AND KEY WORD ANALYSIS PROVIDES THE EVALUATION OF THE CORRECTNESS OF THE ANSWER, ITS COMPLETENESS OR ITS ERROR TYPE. AS A RESULT, AN ASSOCIATED SEQUENCE OF TUITION IS FORMED.
AN ANALYSIS OF DIGITAL ANSWERS PROVIDES THE EVALUATION OF THE CORRECTNESS OF THE PRESENTED DIGITAL ANSWER IN THE SPECIFIC LIMITS. IF THE NUMBER OF SIGNIFICANT DIGITS EXCEEDS THE NECCESSARY NUMBER, IT IS SUGGESTED TO ROUND THE RESULT.
ALONGSIDE WITH THE GENERAL PURPOSE SYSTEMS THERE ARE A NUMBER OF PURELY CHEMICAL ANALYSIS SYSTEMS REALISED ON THE BASIS OF

CHEMICAL RULES AND LAWS, THE ANALYSIS OF THE CORRECTNESS OF FORMULA WRITING, REACTION EQUATION WRITING ETC. SERVICE PROGRAMMES INTENDED FOR GENERAL AND INORGANIC CHEMISTRY COURSE GIVE THE POSSIBILITIES FOR PERFORMING VARIOUS CALCULATIONS, RANDOM SELECTION OF FRAGMENTS AND PROBLEMS, RETRIEVAL OF REFERENCE DATA, DEBUGGING OF METHODOLOGICAL MATERIALS. THE DESCRIPTION OF THE MATHEMATICAL FUNDAMENTALS IS USED FOR CONDUCTING REGULAR LESSONS IN AN AUTOMISED CLASS HAVING 16 TERMINALS OF THE SPECIALISED DISPLAY TYPE)

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